

REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated June 29, 2006 (U.S. Patent Office Paper No. 20060623). In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1, 5-7 and 9-33 stand for consideration, wherein claims 1, 5, 9-11, 13 and 20 are being amended to correct formal errors and to more particularly point out and distinctly claim the subject invention. Claims 2-4 and 8 were previously canceled from this application. All amendments to the claims are supported throughout the specification. Applicant hereby submits that no new matter is being introduced into the application through the submission of this response.

Prior Art Rejections

The Examiner rejected claims 1, 5-7 and 9-33 under 35 U.S.C. §103(a) as being unpatentable over Kenley et al. (US Patent No. 5,276,867) in view of Iwamura et al. (US 2004/0049553), Webber et al. (US Patent No. 5,367,698), and Ofek et al. (US Patent No. 6,108,748). Applicants have carefully reviewed the above rejections, and hereby respectfully traverse.

The present invention as recited in claim 1 is directed to a migration destination file sharing device communicably connected to a migration source file sharing device and a host computer via a communications network, the migration destination file sharing device including: means for relating a plurality of shared file systems of the migration source file sharing device to plurality of shared file systems of the migration destination file sharing device and for determining a mount point that corresponds the shared file systems of the migration source file sharing device to the shared file systems of the migration destination file sharing device, on a shared file system by shared file system basis, the mount point being used to mount one of the shared file systems of the migration source sharing device to one of the shared file systems of the migration destination sharing device, and the migration source shared file systems each having a plurality of files; means for migrating files from the migration source file sharing device to the migration destination file sharing device on a files by files basis; means for setting or changing a migration status of each file; means for causing

access from the host computer to be switched from the migration source file sharing device to the migration destination file sharing device; means for detecting the migration status of a file to which access has been requested by the host computer; means for providing the file from the file system of the migration destination file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file can be used from the file system of the migration destination file sharing device; and means for providing the file from the file system of the migration source file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file cannot be used from the file system of the migration destination file sharing device.

As recited in claim 11, the present invention is directed to a method of causing data to migrate from a file system of a migration source file sharing device to a file system of a migration destination file sharing device via a communications network, the method including the steps of: relating a plurality of shared file systems of the migration source file sharing device to a plurality of shared file systems of the migration destination file sharing device, including determining a mount point that corresponds the shared file systems of the migration source file sharing device to the shared file systems of the migration destination file sharing device, on a shared file system by shared file system basis, the mount point being used to mount one of the shared file systems of the migration source sharing device to one of the shared file systems of the migration destination sharing device, and the migration source shared file systems each having a plurality of files; migrating files from the migration source file sharing device to the migration destination file sharing device on a files by files basis; setting or changing a migration status of each file; causing access from a host computer to be switched from the migration source file sharing device to the migration destination file sharing device; detecting the migration status of a file to which access has been requested by the host computer; providing the file from the file system of the migration destination file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file can be used from the file system of the migration destination file sharing device; and providing the file from the file system of the migration source file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file cannot be used from the file system of the migration destination file sharing device.

As recited in claim 13, the present invention is directed to a computer program stored in a computer readable medium implemented in a file server and for causing data to migrate

from a migration source file sharing device to a migration destination file sharing device via a communications network, comprising: a module for relating a plurality of shared file systems of the migration source file sharing device to a plurality of shared file systems of the migration destination file sharing device, the module being configured to determine a mount point that corresponds the shared file systems of the migration source file sharing device to the shared file systems of the migration destination file sharing device, on a shared file system by shared file system basis, the mount point being used to mount one of the shared file systems of the migration source sharing device to one of the shared file systems of the migration destination sharing device, and the migration source shared file systems each having a plurality of files; a module for migrating files from the migration source file sharing device to the migration destination file sharing device on a files by files basis; a module for setting or changing a migration status of each file; a module for causing access from a host computer to be switched from the migration source file sharing device to the computer; a module for detecting the migration status of a file to which access has been requested by the host computer; a module for providing the file from the file system of the computer to the host computer during the data migration in a case where the detected migration status of the file is a status where the file can be used from a file system of the computer; and a module for providing the file from a file system of the migration source file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file cannot be used from the file system of the computer.

According to claim 20, in a file sharing system that comprises a host computer, a source file sharing device, and a destination file sharing device communicably connected to the source file sharing device and the host computer via a communications network, the destination file sharing device includes: a control unit, the control unit being operatively formed to migrate files from the source file sharing device to the destination file sharing device and to include a first component that relates a plurality of shared file systems of the source file sharing device to a plurality of shared file systems of the destination file sharing device, on a shared file system by shared file system basis, the source shared file systems each having a plurality of files, said first component being configured to determine a mount point that corresponds the shared file systems of the migration source file sharing device to the shared file systems of the migration destination file sharing device, the mount point being used to mount one of the shared file systems of the migration source sharing device to one of the shared file systems of the migration destination sharing device; a second component that migrates the files from the source file sharing device to the destination file sharing device on a

files by files basis; a third component that sets or changes a migration status of each file; a fourth component that causes access from the host computer to switch from the source file sharing device to the destination file sharing device; a fifth component that detects the migration status of a file to which access has been requested by the host computer; a sixth component that provides the file from the file system of the destination file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file can be used from the file system of the destination file sharing device; and a seventh component that provides the data file from the file system of the source file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file cannot be used from the file system of the destination file sharing device.

Among the main features of the present invention, the present invention is directed to the migration of files between two file systems, wherein the data is migrated as files (i.e., file-by-file, files-by-files), rather than as other types of data segments or partitions (i.e., blocks, volumes). As recited in the claims, the invention embodies a device, method, program and system for accomplishing data migration that incorporates, among others, elements or steps for relating a plurality of shared file systems of the migration source file sharing device to a plurality of shared file systems of the migration destination file sharing device, including determining a mount point that corresponds the shared file systems of the migration source file sharing device to the shared file systems of the migration destination file sharing device, on a shared file system by shared file system basis, the mount point being used to mount one of the shared file systems of the migration source sharing device to one of the shared file systems of the migration destination sharing device, migrating files from the migration source file sharing device to the migration destination file sharing device on a files by files basis; and setting or changing a migration status of each file. As illustrated in Figure 3, and as explained on page 24, line 12 to page 27, line 1, the mount point relates the migration source shared file system with the migration destination shared file system so as to allow the transfer of data in segments of files, instead of either blocks or volumes, even though the source and destination migration shared file systems are different from one another. In other words, use of a mount point has the advantage, among others, of allowing the transfer of files between two different shared file systems. Further, when a host computer accesses a file that is transferred from one shared file system to another, the mount point relationship makes the existence of the file in the shared file system of the destination sharing device as opposed to the shared file system of the source sharing device transparent to the host computer.

Further, the invention embodies a device, method, program and system for accomplishing data migration that also incorporates, among others, elements or steps for detecting the migration status of a file to which access has been requested by the host computer; providing the file from the file system of the migration destination file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file can be used from the file system of the migration destination file sharing device; and providing the file from the file system of the migration source file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file cannot be used from the file system of the migration destination file sharing device. As noted above, the use of the mount point allows the tracking of the status of the files being migrated. This tracking of a file's migration status determines whether a host computer can access the file from either the migration destination file sharing device or from the migration source file sharing device. Since the host computer can access the file no matter the status of the file's migration, the availability of the file to the host computer is not interrupted by the operation of the file migration process. In effect, the host computer can access a desired file(s) while the host computer is online with the file sharing devices, even while the file sharing devices are conducting data migration.

In contrast to the present invention, the primary reference of Kenley '867 is directed only to a digital data storage apparatus that is limited to a single processor 12 connected to several devices, including an administration database 14, system disks 18, and backup volumes 20,24. However, because Kenley '867 only discloses a single processor 12, this reference only teaches the structure and operation of a single computer. By itself, Kenley '867 cannot show or suggest, among other features, any structure or operation involving any device, method, program or system related to migrating data from a file system of a migration source file sharing device to a file system of a migration destination file sharing device via a communications network. Further, because this reference is so limited, it also cannot show or suggest any device, method, program or system that involves, among other features, relating a plurality of shared file systems of the migration source file sharing device to a plurality of shared file systems of the migration destination file sharing device, determining a mount point that corresponds the shared file systems of the migration source file sharing device to the shared file systems of the migration destination file sharing device, the mount point being used to mount one of the shared file systems of the migration source sharing device to one of the shared file systems of the migration destination sharing device, the migration source

shared file systems each having a plurality of files; migrating files from the migration source file sharing device to the migration destination file sharing device on a files by files basis; detecting the migration status of a file to which access has been requested by the host computer; providing the file from the file system of the migration destination file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file can be used from the file system of the migration destination file sharing device; and providing the file from the file system of the migration source file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file cannot be used from the file system of the migration destination file sharing device. In effect, since Kenley '867 is limited to disclosing a single processor 12, this reference cannot disclose or suggest any teaching relating to a system involving a network of plural host computers accessing plural storage systems that communicate using for example NFS and/or CIFS protocols, each storage system potentially having its own separate file system, where the different file systems are related to one another through a mount point relationship, such as by using a table that specifies that relationship.

The secondary reference of Iwamura '553 is merely directed to a network information processing system based on SCSI protocols (see ¶¶ [0023]-[0028]), wherein data is migrated in segments of blocks or logical volumes on a LUN by LUN basis (see Figure 3, ¶ [0054]). In addition, as shown in Figure 9, Iwamura '553 specifically discloses the use of a step 901 for issuing a notice of commencement of migration, and a step 902 for issuing a notice of termination of migration (see ¶¶ [0106]-[0109]). Applicant will point out that one of skill in the art would understand that a system that incorporates such steps is necessarily issuing such notices in order to warn users or host computers trying to access data that at least certain portions if not all of the data storage areas are inaccessible during the migration process. Thus, this reference only teaches that data migration is not transparent to the users or host computers accessing the data storage areas. Rather, data migration interrupts the accessibility of the data storage areas to the users and host computers.

Regarding the tertiary reference of Webber '698, the Examiner noted in the Office Action that Kenley '867, Iwamura '553 and Webber '698 all fail to show or suggest any device, method, program or system that incorporates any structure or step for causing access from a host computer to be switched from the migration source file sharing device to the migration destination file sharing device; detecting the migration status of a file to which access has been requested by the host computer; providing the file from the file system of the

migration destination file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file can be used from the file system of the migration destination file sharing device; and providing the file from the file system of the migration source file sharing device to the host computer during the data migration in a case where the detected migration status of the file is a status where the file cannot be used from the file system of the migration destination file sharing device. As such, none of these references, either by themselves or in combination, can render each and every feature of the present invention as claimed obvious to one of skill in the art.

With respect to the tertiary reference of Ofek '748, this reference only teaches data migration that is accomplished on a track by track basis between an existing or first storage device and a replacement or second storage device (see Figure 2, column 8, lines 8-67). Further, this reference fails to disclose any teaching or suggestion for any relationship between one shared file system and another shared file system or for any mount point relationship that would relate one shared file system with another shared file system.

In view of all the above, Applicant will submit that there exist substantial differences between the structure and operation of the present invention and those of the prior art cited. Thus, Applicant will respectfully contend none of the cited references discloses, teaches or suggests any combination of elements or steps that embody each and every element of the present invention. Even more, Applicant will submit that there exist substantial differences between the structure and operation of any one of the cited references cited with those of any other cited reference.

Thus, Applicant will respectfully contend that the Examiner fails to establish a prima facie case of obviousness by properly bridging the proposed modification of the references necessary to arrive at the claimed subject matter (see MPEP §706.02(j)). It is well established that the Examiner is not allowed to select bits and pieces from each reference, and then combining those bits and pieces using knowledge or hindsight gleaned from the disclosure of the present invention as a guide to support the combination. Rather, each prior art reference must be evaluated as an entirety, and all of the prior art must be considered as a whole," *Panduit Corp. v. Dennison Mfg. Co.*, 227 USPQ 337, 344 (Fed. Cir. 1985). See *Para-Ordinance Mfg, Inc. v. SGS Importers Intl., Inc.*, 73 F.3d 1085, 37 USPQ2d 1237 (Fed. Cir. 1995) ("Obviousness may not be established using hindsight or in view of the teachings or suggestions of the inventor."). In this case, the Examiner is using the teachings of references that vary in scope from, among others, using SCSI protocols, to single processors between multiple storage devices, to volume by volume migration, to track by track migration, and to

non-transparent data migration that causes interrupted access to data, all of which are features that teach away from the recited elements as well as the advantages of the present invention.

As a result, the prior art cited cannot render any of the features of the claims invention obvious to one of skill in the art. The present invention as a whole is distinguishable and thereby allowable over the combination of these references.

Conclusion

In view of all the above, Applicant respectfully submits that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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